

MASTER OF COMPUTER SC. & ENGG. 1st SEM. EXAM. -2017**WIRELESS COMMUNICATION AND MOBILE COMPUTING**

Time: 3 hours

Full Marks: 100

Answer question 1 and any four questions
All questions carry equal marks

1. Answer any ten 10X2=20
- i. What are the limitations of wireless networking?
 - ii. What properties of radio wave can be modified to modulate information on it?
 - iii. Why higher frequency wave is used in radio signal based communication?
 - iv. When microwaves are good for communication?
 - v. What is spread spectrum?
 - vi. What is fast fading?
 - vii. How busy tone avoids interference?
 - viii. Differentiate proactive and reactive routing protocol.
 - ix. How many devices can be connected using Bluetooth?
 - x. What is the maximum data transfer speed of the Bluetooth networks?
 - xi. What is scatternet?
 - xii. What is slow start?
2. a) What is the requirement of a path loss model in wireless communication? Explain free space and two ray propagation models. Highlight their limitations. Why signal power level is measured in decibel? 2+(3+3)+2
- b) Why it is not possible to use elaborated MAC schemes from wired networks in wireless? Explain with an example how binary exponential back-off mechanism used in MACA might starve flows sometimes. Discuss how this problem is solved in MACAW. 2+3+5
3. a) DBTMA exhibits better network utilization compared to RTS/CTS based MAC schemes – Explain (with packet transmission diagram). Explain MACA-BI and discuss how good it is in overcoming the hidden terminal problem. 5+5
- b) Explain MACA/PR with packet transmission diagram. Why it is good for real time traffic support? Why the throughput of MARCH is significantly high when compared to MACA (explain with a handshake interaction diagram)? 3+2+5

4. a) What is the difference between proactive and reactive routing (Give examples of some protocols of both types)? Describe the main methods of obtaining routes for both types. How does the Zone Routing Protocol (ZRP) combine proactive and reactive routing? What function do the peripheral nodes have? 2+2+4+2
- b) How can geographical information be utilized for routing in Ad hoc networks? Explain AODV routing protocol with suitable figure(s)? Is a table-driven routing protocol suitable for high mobility environments? 3+5+2
5. a) Explain the differences between Link State and Distance Vector routing. Define the following three metrics: packet delivery ratio, routing overhead and path optimality. Use these metrics to discuss the performance differences between DSDV and DSR routing algorithms. 2+3+5
- b) Discuss packet delivery and registration of Mobile IP. Explain any two mobile IP encapsulation techniques. When communication involving mobile IP can be inefficient? 3+4+3
6. a) What is the reaction of standard TCP in case of packet loss? In which scenario standard TCP is not a good choice for wireless networks or mobility. Explain M-TCP and discuss how does it maintain end-to-end TCP semantics. 3+2+(3+2)
- b) Explain working principle of snooping TCP. When indirect TCP is applied, describe a scenario when the TCP end-to-end semantics can no longer hold. When comparing indirect TCP and snooping TCP, which one has a higher handover latency (when the mobile host moves from one foreign network to another), explain with an example? 5+2+3
7. a) What are the three physical layer technologies being used in 802.11 wireless networking? Explain the distributed coordination function (DCF) of 802.11 MAC layer. Why different inter frame spaces are required? 3+5+2
- b) Explain architecture of Bluetooth networks and list the elements in the Bluetooth protocol stack. How many connection modes are used in Bluetooth? Explain the link controller states during connection process. 5+5